

In the Claims:

Claims 1-85 (Canceled)

86. (Currently amended) The construct of claim 96 85 wherein said collagenous support matrix is prepared from Type I collagen or Type II collagen.

87. (Currently amended) The construct of claim 86 85 wherein said collagenous support matrix is a sponge or honeycomb lattice containing a plurality of pores of dividing- the space into a fluidically connected interstitial network.

88. (Previously presented) The construct of claim 87 wherein chondrocytes are seeded in the support matrix at a cell density between about 12 and 15 millions.

89. (Canceled)

90. (Currently amended) The construct of claim 86 85 wherein said chondrocytes are activated at an oxygen concentration of about 2%.

91. (Currently amended) The construct of claim 96 85 wherein said tissue processor is an apparatus comprising

a culture chamber containing culture medium and a supply unit for the continuous and intermittent delivery flow of the culture medium,

a pressure generator for applying atmospheric or constant or cyclic hydrostatic pressure above the atmospheric pressure at predetermined periods; and

a means for delivering nitrogen, carbon dioxide and oxygen

Tissue Engineering Support System (TESS™) culture unit comprising at least a culture unit for culturing chondrocytes seeded in said matrix, a supply unit for supplying a culture medium to the culture unit and the pressure generator for applying the constant or cyclic pressure to chondrocytes.

92. (Canceled)

93. (Currently amended) The construct of claim 86 85 wherein when said chondrocytes are activated at the perfusion rate of about 5 $\mu\text{l}/\text{min}$ the activated chondrocytes produce 107.33 μg of S-GAG.

94. (Currently amended) The construct of claim 86 85 wherein additionally said chondrocytes are activated at about 5% concentration of carbon dioxide.

95. (Currently amended) The construct of claim 86 85 implanted into a cartilage lesion wherein when said chondrocytes are activated at 2% oxygen concentration the activated chondrocytes produce 105.59 μg of S-GAG.

96. (Currently amended) An implantable hyaline cartilage construct comprising activated chondrocytes, said construct prepared by a process comprising steps: preparing a collagenous porous support matrix having pores between 100 and 300 μm , seeding said support matrix with isolated expanded mammalian chondrocytes that are in a static non-dividing stage, in a collagen solution at a density between 3 and 60 million of cells/mL of the collagen solution;

subjecting said matrix seeded with said chondrocytes to activation to an active stage wherein said activated chondrocytes divide, multiply and promote growth of an extracellular matrix, said activation performed in a tissue processor and comprising treating said matrix seeded with said chondrocytes to a cyclic or constant hydrostatic pressure between at about 3 MPa 0.5 MPa and 5 MPa above atmospheric pressure, wherein for the cyclic hydrostatic pressure, such pressure is applied at a frequency about 0.5 Hz between 0.001 Hz and 2.0 Hz, wherein the cyclic or static hydrostatic pressure is applied for about [[1]] 7 hours to about 14 30 days, followed by a resting period of about [[1]] 7 days to about 28 60 days, under perfusion with a perfusion medium at a rate of perfusion flow between 1 of about 5 $\mu\text{L}/\text{minute}$ and 500 $\mu\text{L}/\text{minute}$ and under oxygen concentration between 1% and 20% of about 2-5%,

wherein the tissue processor comprises at least a pressure generator for applying a constant or cyclic hydrostatic pressure,

wherein following said treatment, said activated chondrocytes are in an active stage where they divide, multiply and promote growth of the extracellular matrix by producing produce up to 152% more sulfated glycosaminoglycan (S-GAG) than and DNA, wherein

production of S-GAG by said activated chondrocytes is increased to at least 152% compared to non-activated chondrocytes not subjected to said activation, and wherein said activated chondrocytes produce a higher content of DNA, expressed as a DNA content index, determined by Hoechst Dye DNA assay, is increased by said activated chondrocytes to the DNA content index 1.49 compared to that of the DNA content index 1, observed in non-activated chondrocytes not subjected to said activation.

97. (New) An implantable hyaline cartilage construct comprising
a collagenous support matrix having pores between 100 and 300 μm ; and
activated dividing, multiplying mammalian chondrocytes producing up to 152% of S-GAG compared to non-activated chondrocytes and having increased DNA content index 1.49 compared to that of the DNA content index 1 observed in non-activated chondrocytes.